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APPLICATION OF CHEMISTRY TO AGRICULTURE.

A knowledge of the composition of plants, soils, and manures is of the greatest importance to the farmer, for it enables him to supply by suitable manures those ingredients which do not exist in the soil, but are necessary for building up the different parts of cultivated plants. The inorganic parts of plants are derived from the soil, the organic from the atmosphere. In burning plants the remains of their inorganic ingredients are found in their ashes, while the organic are dispelled in the process of incineration. The ash of plants is not simple, but is composed of various substances, and these substances vary in different kinds of plants, and also in different parts of the same plant. The mineral matter contained in the ashes of potatoes, and the ash of the grain of wheat is different from that of their leaves and stem. For a knowledge of these important facts we are indebted to modern chemistry, and this shows the very great importance of applying this science in the operations of the farm.

It is only when we know what substances are required by any particular crop, that we succeed in its cultivation. All the mineral ingredients of plants are derived from the soil; and if the soil does not contain in sufficient quantity those ingredients which are required for the grain of a cereal plant, the grain will not come to perfection; and if the soil be deficient in the mineral ingredients which are necessary to build up the stalk, the head may grow, but the stalk will be unable to sustain its weight. According to the proportion and condition in which the elements of the ash of plants exist in a soil, will it be fertile or barren. Of course the ingredients found in their ash do not constitute the sole food of plants, for besides potash, soda, lime, magnesia, alumina, silica, sulphuric acid, phosphoric acid, &c., they require carbonic acid gas, hydrogen, oxygen, nitrogen, ammonia; and that these gases constitute the greatest part of their weight is seen in the small complement of ash that remains when they are driven away by burning.

As the organic ingredients of plants are supplied by the atmosphere, which, at all times, and in every part of the world, contains an inexhaustible supply of them, it is clear that the attention of the farmer should mainly be directed to furnishing the soil with those mineral elements which are capable of exhaustion, and which may be supplied by artificial means. Next, therefore, in importance to a knowledge of the composition of the ash of cultivated plants, is the investigation of the composition of the ash of soils, and the amount of mineral matter which these soils are capable of supplying to crops of various kinds. Soils are formed by the decomposition of rocks, and if these rocks contained only one kind of matter, it would be impossible for plants to procure the necessary subsistence from their *debris*. The clay-slate rock, from the decomposition of which the soils of some countries are formed contains no less than five or six of these elements which form the organic food of plants. The golden rule in applying manure to the soil, is in the first place to make ourselves acquainted with the substances naturally present in the soil, so that we may supply to it those elements in which it is naturally deficient, or of which it has been deprived by the crops which have been grown on it.

There can be no question of the great value of lime in its different forms, but some persons imagine that by applying it plentifully they are giving to the soil everything it requires, and they are consequently disapointed in the results of the application. Now, although lime is a leading ingredient in the composition of some plants, there is very little of it to be found in others, and even for what are called "lime plants," other ingredients are necessary. If the land is poor in other substances, lime alone will not make it rich. It is not sufficient to supply cereal crops merely with material for building up the stem and leaves. They must also be furnished with the elements of the grain. It will not be sufficient to supply lime, and withhold potash, phosphates, and nitrogenous manures. This is a subject of great importance, which demands the serious attention of farmers. No opportunity should be lost of acquiring a knowledge of the composition of plants, soils, and manures. Works on agricultural chemistry should be studied, lectures of the professors of chemistry at the agricultural colleges should be largely attended by farmers, experiments made, and more light thrown on everything connected with the application of chemistry to the science of agriculture.

"GEE" LANDS IN PLOWING.

How often do we see fields whose beauty is greatly marred and impaired by throwing the furrows from the outside toward the center every time they are plowed. Now this is easily prevented by plowing "gee" lands.

To lay off a "gee" land, we will suppose the land you wish to plow is rectangular, eight rods wide; measure in from one side, four rods, and set a stake. Do this from two or three other points of the same side, and you will have a line of stakes. Next, go to the end of the land, get in range of the stakes and measure four rods; step back two paces and that will be the point to start your plow into the ground. In the same manner determin where your plow must stop. Plow back and forth, throwing your plow around the ends until your plowed strip is four paces wide, then plow across the ends. As you come around, be careful to plow parallel with the outside of the field, and your "gee" land is fairly started, ready for work.

As you near the corners of the land make the horses walk straight out and when you have plowed to within about 15 feet of the outside of the land, if some parts of your narrow strip seem wider than others, let the plow cut more: in some places it may be necessary to let the plow run empty for several rounds.

The advantages are evident; the horses turn on the hard ground, not even putting a hoof on the plowed; your land is thrown up like a garden bed, and the dead furrows formed by plowing "haw" are filled up, and the sink holes we see in some old fields, abolished.

You can plow almost any shaped land "gee," by commencing in the middle and being careful to plow parallel with the outside.

PREMIUM CORN CROPS IN MISSOURI.

The Carthage (Mo.) *Banner* publishes the following:

The Moline plow company's premium of a 835 cultivator for the best five acres of corn was awarded to Col. J. D. Allen. There were 12 entries for this premium, and it will be no disgrace to those who were beaten to publish the whole list, especially as it proves a little of what Jasper County can do:

John Elliott	5 acres,	average	75 bushels per acre.
J. A. Loop	5 "	"	85 "
J. K. Gibson	5 "	"	113½ "
Also had	20 "	"	100 "
John D. Allen	5 "	"	115 "
Also had	24 "	"	110 "
John W. Gray	5 "	"	75 "
Also had	40 "	"	70 "
Wm. Kelsey	5 "	"	75 "
Also had	20 "	"	70 "
Geo. Wolf	5 "	"	70 "
F. McGuire	7 "	"	86 "
R. Morris	5 "	"	107 "
Also had	30 "	"	107 "
J. C. Pitts	5 "	"	95 "
Also had	40 "	"	80 "
David Felton	5 "	"	81 "
Also had	12 "	"	75 "
Wm. Collings	5 "	"	80 "
Also had	75 "	"	75 "

Each of the above pieces were measured, and then a small square of average hills taken, gathered, shelled by three distinguished persons, viz.: Judge John Onstott, W. H. Rusk and Jonathan Rusk, appointed by our general agent, Maj. A. J. Barney. They spent three or four days in making the measurements. E. P. SEARLE, Cor. Sec'y.

R. P. Pollard stated at a recent meeting of the Chester Farmers' Club that in 1837 he bought the Lakin farm in Plymouth; it contained 300 acres of poor land, with no fences around it. The first season he owned it he mowed 50 acres of it and carried off all the hay on two loads. This 20 acres had two pond holes at each end of it, and the land was wet cold and sour; he drained it, carted on sand, and spread it six inches deep, the drains rendered it dry and the sand made it warm. The land had never been plowed, he top dressed it with manure and dragged spruce boughs over it. This same land now cuts two tons to the acre.

PLANT FOOD.

Dr. Hoskins, the able editor of the VERMONT FARMER, believes that sorrel has the power of decomposing feldspathic rocks through the agency of oxalic acid, which it holds as a constituent. The Doctor's industry in hunting up authorities to support his views is to be commended; but it is a hard point to prove that oxalic acid, in or out of connection with plants, will not act upon "solid feldspar sand" and decompose it. If a plant elaborates oxalic acid, it is simply oxalic acid, and it must behave in the presence of other bodies as it does when produced from other sources. It does not matter from whence it comes, and inasmuch as "solid feldspar sand" is totally insoluble in oxalic acid, it cannot "dissolve out any potash to supply its wants." This is one point in our criticism in the November number of the *Journal*; the other was, that plants have not the power to prepare their own food. If this is not an axiom in vegetable chemistry, we must go back to the period when researches began, and commence study on a new basis. The opposite view is contrary to analogy and facts, and the quotations from Prof. Johnson do not, when carefully considered, support such an hypothesis. Liebig's statement regarding the action of rootlets upon limestone pebbles does not afford satisfactory proof that the decomposition results from the labors of the plant to secure food, since the same furrowing occurs upon iron aqueduct pipes when the roots of trees twine around them. The mere contact of vegetable substances, living or dead, with limestone, above ground or below, will, under certain conditions, serve to promote decomposition. This is seen in marble buildings, and in limestone boulders. The cryptogamic plants, to the existence of which all life is due, are presumed to have originated from seeds or germinal principles, and so have the lichens which live and thrive upon bare rocks. Have the little germs the power of manufacturing their inorganic food from the refractory rock to which they cling? No. How then do they secure their food? The answer is obvious. Every rock exposed to rains, air, and sunshine is constantly subjected to decomposing influences. There is a trace of nitric acid brought in contact with rocks by rain water, which probably results from decomposition of air by electrical agency; this acts upon rock surfaces. Water itself has solvent powers; carbonic acid, always present in air, is an active decomposing agent, and moreover, the fact is established that all rocks, however bare they may appear to be, have *indeed a thin covering of dust*, sufficient in amount to afford ample nourishment to the low forms of plant life. The Creator has provided forces whose especial work it is to prepare morganic food, so that it can be taken up by water and carried into plant structures, but he has not conferred upon plants the capability of dissolving and preparing their own food.—*Boston Journal of Chemistry.*